

Listing of Claims:

1. (Currently Amended) A method of optimizing a two-dimensional image of a body volume which contains an object, ~~in which~~ the method comprising:
acquiring a first two-dimensional image of the body volume with the object in the body volume;
a) ~~acquiring~~ a three-dimensional representation of feasible locations of the object within the body volume is acquired;
b) ~~determining the~~ a current position of the object in the body volume based on the first two-dimensional image; is determined and
associating with the current position of the object with the three-dimensional representation;
e) ~~determining~~ imaging parameters which are optimum in respect of the position of the object are determined by means of based on the three-dimensional representation;
and
d) controlling movement of an imaging system based on the imaging parameters;
and
generating a second two-dimensional image of the body volume is generated by means of said based on the optimum imaging parameters.
2. (Currently Amended) A method as claimed in claim 1, wherein the two-dimensional image is a projection of the body volume which has been generated by means of X-rays, and wherein the second two-dimensional image is generated without using external markers for comparing images.

3. (Currently Amended) An imaging system for forming a two-dimensional image of a body volume which contains an object, ~~which the system comprising:~~

a data processing unit with a memory which stores a three-dimensional representation of feasible locations of the object within the body volume, the data processing unit being ~~adapted~~arranged to:

determine a current position of the object in the body volume based on a first two-dimensional image of the body volume;

a) ~~to~~ determine imaging parameters which are optimum in respect of ~~the~~a current position of the object ~~by means of~~based on the three-dimensional representation; and

b) ~~to~~ control movement of the imaging system based on the imaging parameters in such a manner that ~~it~~to generates a second two-dimensional image with said imaging parameters.

4. (Currently Amended) An imaging system as claimed in claim 3, ~~wherein it includes~~further comprising an X-ray apparatus with an X-ray source and a detector which are attached to a movable C-arm, wherein the second two-dimensional image is generated without using external markers for comparing images.

5. (Previously Presented) An imaging system as claimed in claim 4, wherein the X-ray apparatus includes adjustable diaphragms whose adjustment forms part of the imaging parameters optimized by the data processing unit.

6. (Currently Amended) An imaging system as claimed in claim 3, wherein the data processing unit is coupled to at least one of ~~signal leads, notably for an ECG, of a~~ respiration sensor and/or ~~of~~ a localizing device for the object.

7. (Currently Amended) An imaging system as claimed in claim 3, ~~wherein it is arranged to determine the current position of the object from a two-dimensional image~~ the imaging parameters comprise at least one of a sectional plane of an image and a projection direction.

8. (Previously Presented) An imaging system as claimed in claim 3, wherein the imaging parameters define a sectional plane, a projection direction, the position of a radiation source, the position of an imaging radiation detector, the shape of an imaging window, the position of radiation-attenuating diaphragm elements, variances in the radiation field across an irradiated surface, a radiation quality, a radiation intensity, the current and/or the voltage of a radiation source and/or an exposure time.

9. (Currently Amended) An imaging system as claimed in claim 3, wherein the feasible locations of the object are vessels within a biological body volume, and that the data processing unit is arranged to define the optimum imaging parameters ~~in such a manner that~~causing the segment of the vascular tree in which the object is situated ~~is to be~~ projected essentially in a planar fashion in the two-dimensional image.

10. (Previously Presented) An imaging system as claimed in claim 3, wherein it includes a device for the formation of images and is arranged to display the two-dimensional image in superposed form together with an image formed from the three-dimensional representation with completely the same or partly the same imaging parameters, the image formed from the three-dimensional representation preferably reproducing an area which is larger than that reproduced by the two-dimensional image.

11. (New) The method of claim 1, further comprising generating the second two-dimensional image in a shape of a rectangle, wherein the object has a tip in proximity to a first short side of the rectangle, and wherein a vascular segment of the body volume extends to a second short side of the rectangle.

12. (New) The method of claim 1, further comprising generating the second two-dimensional image without using back projection of the first two-dimensional image.

13. (New) The imaging system of claim 3, wherein the second two-dimensional image has a shape of a rectangle, wherein the object has a tip in proximity to a first short side of the rectangle, and wherein a vascular segment of the body volume extends to a second short side of the rectangle.

14. (New) The imaging system of claim 3, wherein the second two-dimensional image is generated without using back projection of the first two-dimensional image.